8. PERSISTING DIGITAL SOCIETY TERRITORIAL DIVIDES

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8.1. Introduction

The growing importance of Information and Communication Technologies (henceforth ICTs), digital penetration, wireless communication and social media in economic, political and socio-cultural development comes to stark contrast with the scarcity of available research on their societal role. The rapid transformation of digital societies has been felt by present generations who were living adult lives without a mobile phone until the mid-1990s, or without a computer, for that matter. After briefly discussing above what is seen in each of the maps that have been developed, we now turn to what they represent all together, what is left out of them, and what policy guidelines towards "Smart Growth", under the EU2020S, can be concluded from them. This last point is dubious, because none of the obstacles and action areas detailed in the flagship initiative "A Digital Agenda for Europe" (summarised by Lois, 2012: 25-28; European Commission, 2010) are relevant with mapping as such. Nevertheless, we will discuss digital societies in combination with the flagship initiatives "Innovation Union", "Youth on the Move", and "An Agenda for New Skills and Jobs", which are all relevant with the flagship initiative "A Digital Agenda for Europe" and are basic dimensions of "Smart Growth" under the EU2020S.

In general, digital society signals have been called by many as "the process of convergence". Integration takes place at one of the following levels (van Dijk, 2006: 7):

- Infrastructure — for example combining the different transmission links and equipment for telephone and computer (data) communications.
- Transportation — for example Internet telephony and web TV riding on cable and satellite television.
- Management — for example a cable company that exploits telephone lines and a telephone company that exploits cable television.
- Services — for example the combination of information and communication services on the Internet.
- Types of data — putting together sounds, data, text and images.

However, it has been pointed out several times that "The digital revolution has transformed the lives of many, but also has left untouched the lives of many others. As a result, a large segment of the world population misses out on the tremendous political, social, economic, educational, and career opportunities created by the digital revolution. This gap between the information haves and have-nots is commonly referred to as the *digital divide*" (Yu, 2002: 2). It is under this perspective that current and future research ought to be directed.

8.2. Regions or Cities with Weaknesses or Challenges

Systematisation of regions done above shows that weaknesses occur on the Eastern and Southern periphery of Europe especially as concerns people working at the ICT sector (weakest regions are located in the South-Eastern macro-region, Map 8.1), broadband penetration (weakest regions in the Balkans, Map 8.2), e-commerce (Map 8.3, "worst" regions in Southern Europe). However, the situation is reversed in the indicator of individuals who have never used a computer (Map 8.4), with the EU core as the most disadvantaged in this respect.

However, the assessment through mapping is not adequate or reliable. Weaknesses may be considered as challenges, as in Map 8.2 which represents a condition easy to address by policy, and may hide opportunities in other respects, as in Map 8.4. There are alternative opportunities for populations in the EU core who have never used a computer, as we will discuss below.

All maps corroborate the general agreement among researchers, that income and GDP relate positively with digital penetration rates (Castells *et al*., 2004: 9-10). Weaknesses concentrate where digital exclusion occurs. This has snowball effects towards poverty and disadvantage. "The distribution of benefits is far from evenly spread. As argued by the e-inclusion report of the EC ([European Commission], 2001), whilst Internet usage increases in all groups, access gaps are getting broader. Moreover, digital exclusion is frequently cumulative, adding to other social disadvantage. […] [P]eople with low income, the less educated, and the unemployed are well below the average level of Internet access; older people and the disabled are another particularly disadvantaged group; and gender differences are particularly strong within groups that are disadvantaged for other reasons. The e-inclusion strategy […] should be part of broader actions aimed at combating social exclusion" (Craglia *et al*., 2004: 54-55).

Going about the fascinating task of discovering and then explaining geographies of the digital society in Europe and globally, we have used some crude indicators, for instance: "the number of computer shops and Internet café's, or the per capita number of cellular phones (which increasingly incorporate IT services) as some proxy for the availability of physical access; the range of e-services provided by the local authority and number of hits on their website as a measure of flow; and the number of government services providing different forms of reply or interactivity as a proxy for the attitude of the local authority to public participation" (Craglia *et al*., 2004: 61). We soon came to realise, however, that the mapping of indicators is not sufficient. "Surveys are likely to be necessary at any rate to address particular areas of disadvantage, and capture more qualitative measures of relevance, use, and need of Internet-based information and services. As an example, and following the recommendations of the e-inclusion report ([European Commission], 2001) the number and extent of local on-line community initiatives in disadvantaged neighborhoods are important indicators to be developed to ensure that cumulative social exclusion is not ignored or hidden inside average city-wide measures" (Craglia *et al*., 2004: 61).

Income and GDP do not explain the whole range of variations. "Beyond economic indicators, there are other factors such as culture and government policy, that may influence the rate of wireless technology penetration (Castells *et al*., 2004: 10). There are also strong geographical factors which may supersede income and GDP. Map 8.4, indicating less penetration of laptops in the dense European core, must be seen in its geographical context. Peripherality creates dependence on computers and wireless technology. Scandina-

vian supremacy and innovations must be seen in the context of the relevant landscapes. Forests with a very sparse settlement pattern are quite important for the boost of production and penetration there. The Greek islands are also a positive environment, but production here has lagged, in contrast with penetration of ICTs, especially boosted by residential tourism (Leontidou, 2006). By contrast, France was content with teletext for a long time and did not create any important digital dependence.

As to policy guidelines, "In the competition among member states, regions, and cities to win the prize for the 'most connected', the danger is that the emphasis will continue to be given to measures of physical access, and much less on social access (Kling, 1999), that is, the extent to which users have the ability to search, retrieve, interpret, and use the information they are seeking. Moreover, that pockets of disadvantage will be conveniently ignored to concentrate on average measures." (Craglia *et al*., 2004: 54-55).

From the perspective of employment, a shortage of ICT practitioners is mentioned by the "Agenda of New Skills and Jobs" flagship initiative (Lois, 2012: 30, 38), at the same time when ICT experts are released into unemployment, redundant from in e-skilled jobs, especially in the European South worst affected by the crisis. Map 8.1 most probably reflects the shortage of ICT jobs. This relates in a negative way with this flagship initiative and in this, policy is essential. Besides wasting achievements of educating a population for the Digital Society, the 'brain waste' of ICT workers is a serious matter, mentioned by the EU2020S (Lois, 2012: 37). Policy for employment creation and insertion in the South-East of Europe is urgent, especially given the economic crisis.

8.3. Regions or Cities with Strengths or Potentials

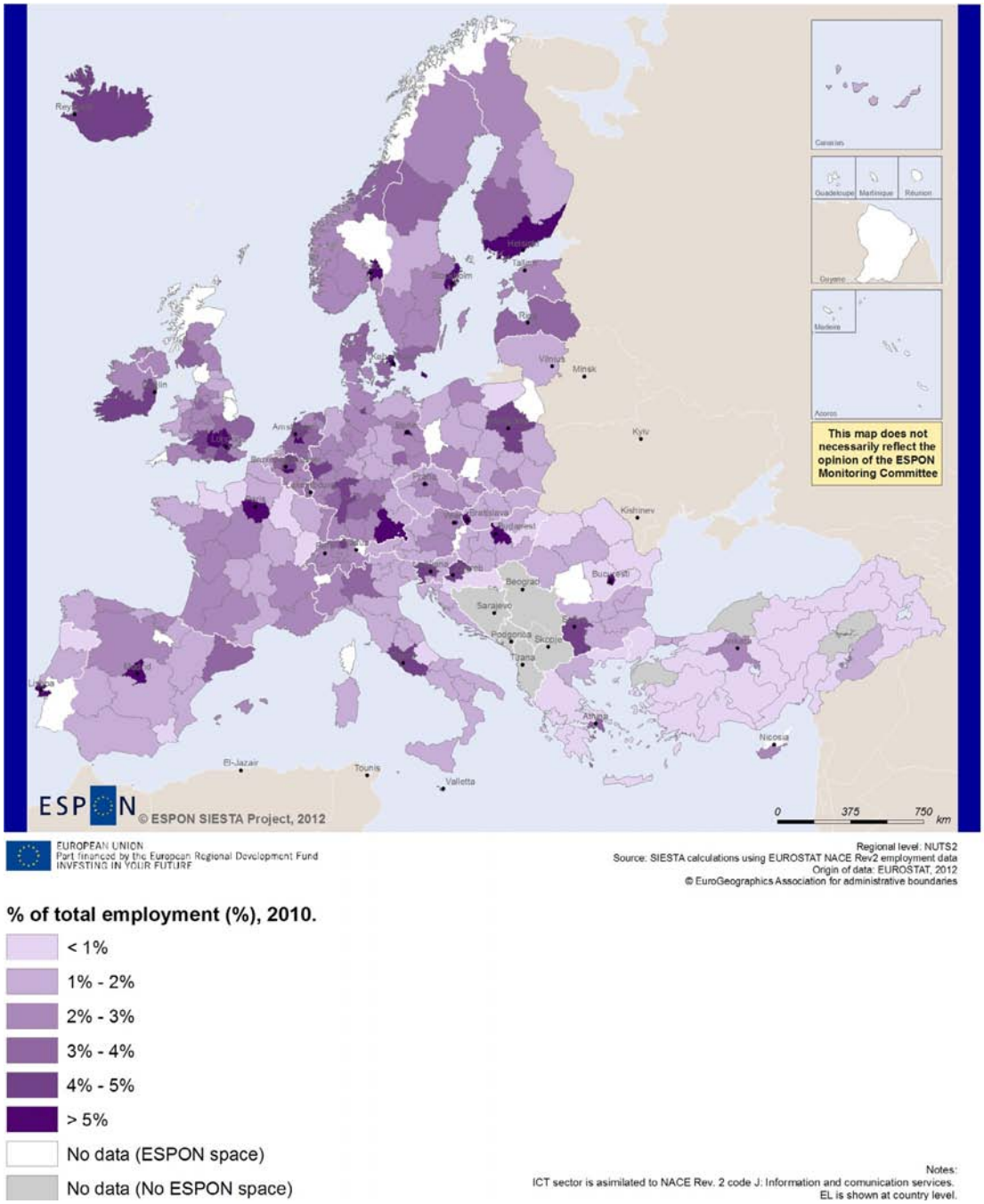
Europe is quite strong in ICT development, though the systematisation of regions done above shows that strengths decline as we move to the Southern and Eastern periphery of the EU. By contrast, the Nordic countries are strong in every respect, and have innovated globally in ICT development.

This started with the mobile phone. Cellphone penetration moved from North America in the early 1990s to Europe in the new millennium. This "shift in the trend can be attributed to the spillover effects from the four Nordic European countries that propelled Europe into the forefront of wireless communication technology usage. Europe […] has followed most closely the classic S-shaped diffusion curve for mobile adoption, while North America and Asia have relatively more gentle trends. At this point, a second observation that

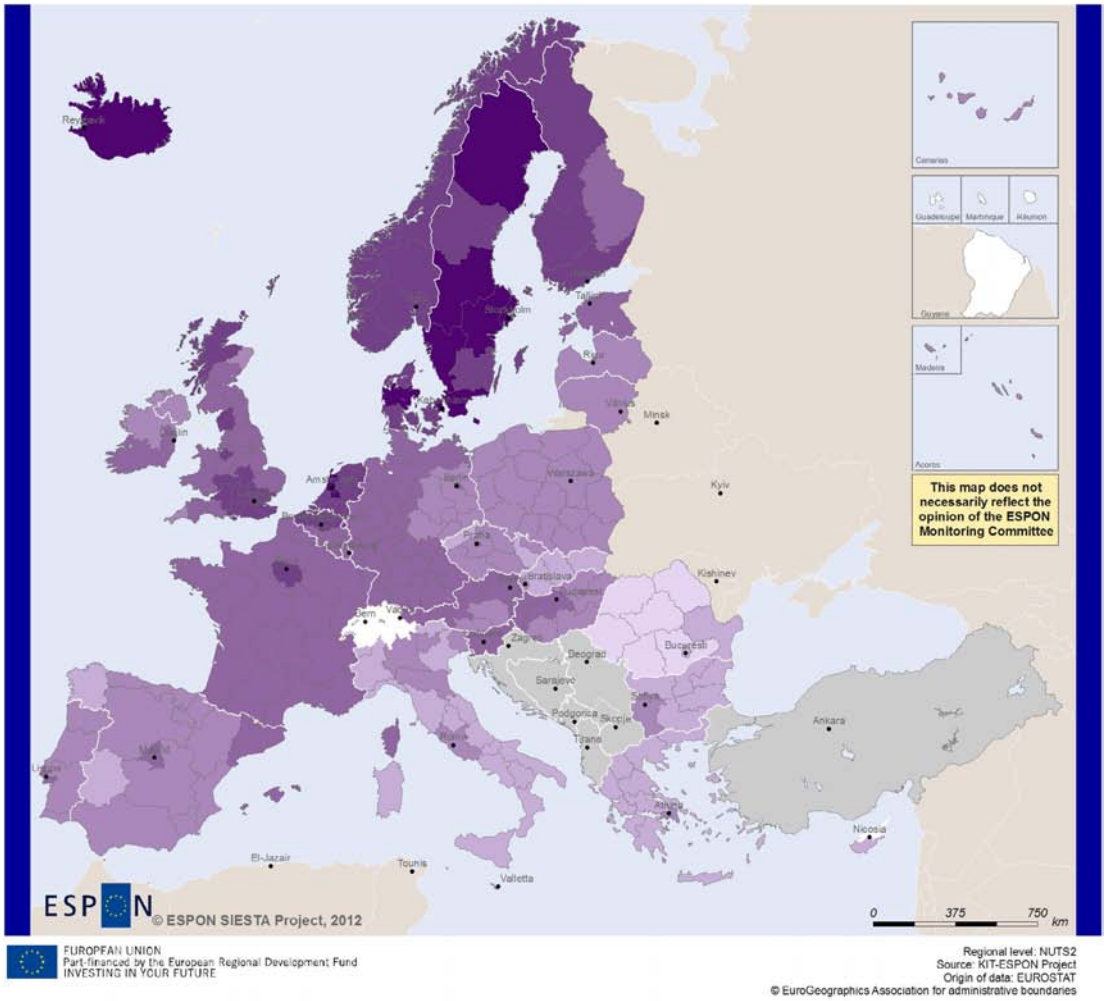
stands out is the growth spurt experienced in Europe between 1997 and 2000" (Castells *et al*., 2004: 7). "Nordic countries worked together in the establishment of an European standard normative, GSM, which is, indeed, one of the factors that helped the diffusion of mobile telephony in the continent […]. The GSM standard was assumed by all the EU members, meaning that the same standards had been imposed in the richer part of the continent" (Castells *et al*., 2004: 13). Due to lack of available datasets at the regional scale, SIESTA maps do not include indicators for the cellphone, and this is a major gap according to the following analysis.

Strengths and potentials also concentrate in cities. Metropolitan areas are not particularly stronger in two of the maps, but they are in e-commerce (Map 8.3) and people employed in the ICT sector (Map 8.1). Worldwide, "the countries with the highest urbanization levels do not have the highest mobile penetration rates. Uruguay and Argentina are the most urbanized but have the eighth and sixth highest mobile penetration respectively" (Castells *et al*., 2004: 8). Peripherality apparently creates ICT dependence. However, in other respects, mapping shows that cities are dense in digital ICTs and social media, and many urban environments are rich in information systems and data sources. "Cities are particularly affected by the impacts of ICTs. Although early analysis predicted that the development of ICTs would be the 'death of distance' (Cairncross, 1997) rendering the urban agglomerations meaningless, the evidence points to the contrary: cities remain very much the central nodes of power relations and communication infrastructures even in the new digital economy (Castells, 1996)." (Craglia *et al*., 2004: 54).

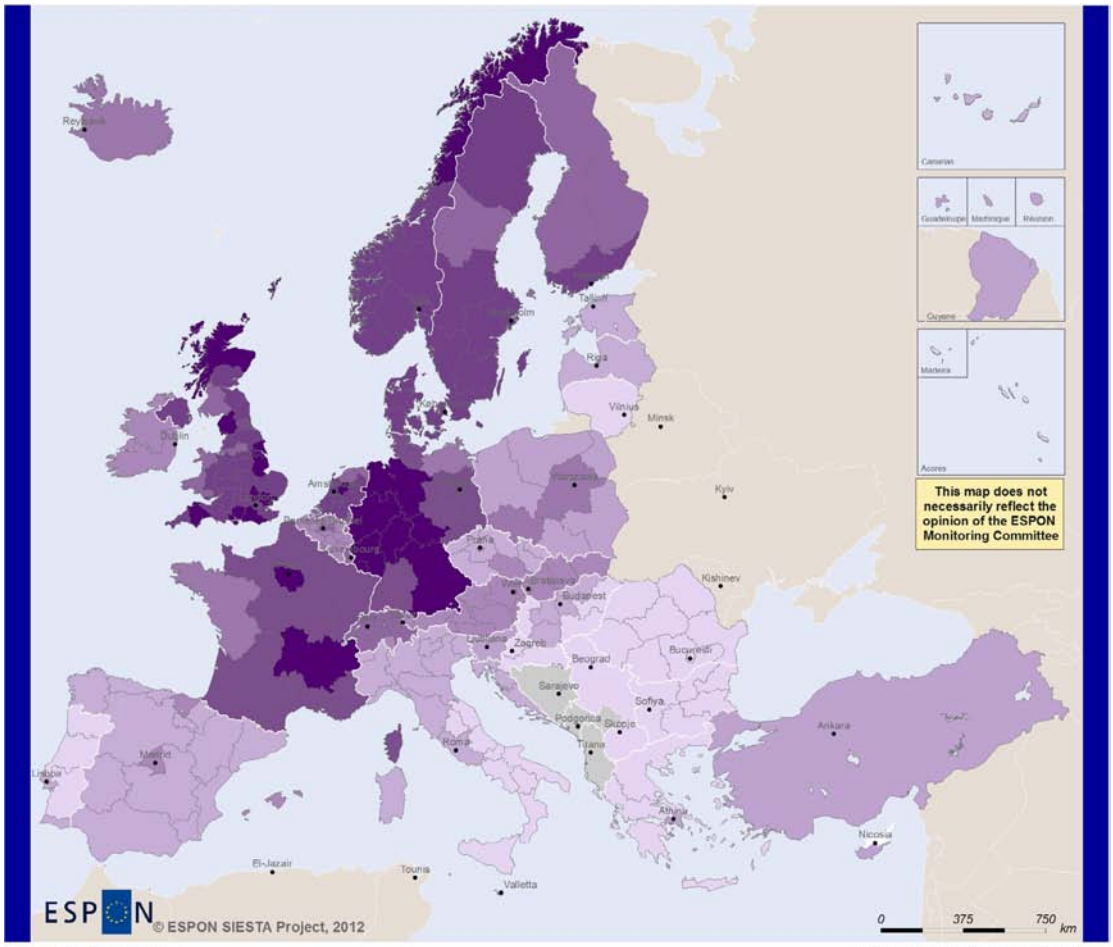
The strength of the Internet currently is that it becomes increasingly interactive. This exchange, communication, interaction and movement cannot be captured in maps, not only because of the risks of the 'ecological fallacy'. A cross-sectional figure on a map does not capture the rapid movement of "multimodal communication from anywhere to anywhere where there is the appropriate infrastructure" (Castells *et al*., 2004: 1) or "the deep connection between wireless communication and the emergence of a youth culture (that leads to what we call a mobile youth culture)" (Castells *et al*., 2004: 3), or "the transformation of language by texting and multimodality, the growing importance of wireless communication in socio-political mobilization, 'particularly outside formal politics' (p.3), and changes in the practice of time and space resulting from wireless communication" (Castells *et al*., 2004: i). Such strengths must be seriously considered as to their geographical consequences.



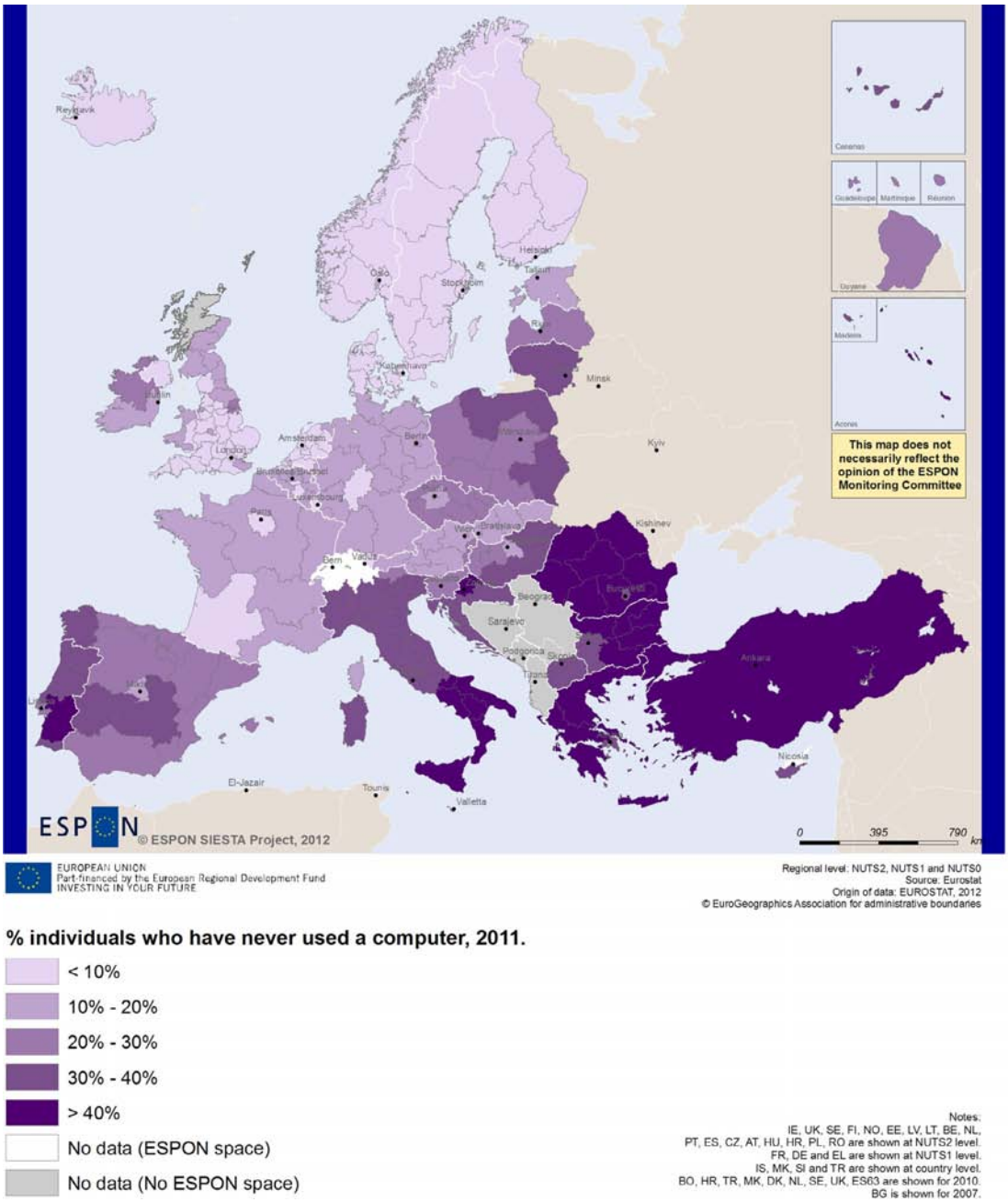
Map 8.1. People working in the ICT sector as percentage of total regional employment, 2010.



Map 8.2. Broadband penetration rate as percentage of total regional households, combined years from 2006 to 2009.



Map 8.3. Individuals (aged 16 to 74) who ordered goods or services over the Internet for private use as percentage of regional population, 2010.



Map 8.4. Individuals who have never used a computer as percentage of regional population, 2011.

8.4. Policy Guidelines and Limitations of the Available Maps

Policies for the Digital Society cannot be formulated in a territorial way, except for the obvious aspect of cooperation among regions, which is facilitated by networking, social media and the interactive technologies of ICT and cultures. Otherwise, policies must be formulated thematically. From the examination of the 4 maps we proposed policy guidelines from the perspective of employment, since Map 8.1 most probably reflects the shortage of ICT jobs rather than the shortage of ICT expert personnel. This relates in a negative way with several EU2020S flagship initiatives, and relevant policy for employment creation and insertion in the South-East of Europe is urgent, especially given the economic crisis.

However, even in this, the maps do not deal with two important qualifications: (1) the very "transformation of the work process and of the work place by wireless communication" (Castells *et al*., 2004: 2) and (2) the fact that "the more a technology is interactive, the more it is likely that the users become the producers of the technology in its actual practice" (Castells *et al*., 2004: 1).

There is a scarcity of research in new phenomena of ICT development, and a low level of insertion of ICT problematic into the social sciences. We should be in full awareness that still, 8 years after Castells *et al*. (2004) produced a report on wireless communication, "because of the novelty of the phenomenon and the slow motion of traditional academic research to uncover new fields of inquiry, the stock of contrasted knowledge on this subject is too limited to grasp empirically the emerging trends that are transforming communicative practices." (Castells *et al*., 2004: 1). The scarcity and poverty of research has boosted the imaginations of visionaries, futurologists, planners and artists at least until the turn of the millennium, often with views which subsequently proved to be wrong (e.g. Cairncross, 1997).

Policy guidelines are thus a difficult task, given limitations of data availability, not only in EUROSTAT and beyond. Social surveys are urgently needed to understand the phenomena. Regarding the present mapping exercise, it is also limited, since data is scarce; however, there are sources for additional indicators which the EU2020S has not tapped because they are not at the regional scale.[1] As this kind of technology develops, additional indicators can

1 Indicators such as those reported by Craglia *et al.* (2004: 60): percentage of the population regularly using the Internet, number of computers at school per 100 pupils, participation through the number of Public Internet Points per 1000, percentage of central government websites, etc.

be created, digitally.[2] Another problem is that the rapidity of transformation makes "descriptive data become rapidly obsolete" (Castells *et al*., 2004: 2). The ESPON-SIESTA maps have been constructed to represent a small set of indicators among many, in one time period. The limited availability of diachronic cross-country indicators and available at the regional scale has limited the research ambitions. The indicators mapped are rather out of date even two years after data collection, in the face of a rapidly changing reality, and they do not capture at least two time periods in order to help us assess ICT change and diffusion of wireless communication, which is rather more important than a cross-sectional image of it.

The maps do not capture the diversity of alternative ICT infrastructures which oscillate in the different countries or even regions: as already a comparison between Maps 8.1 and 8.4 has shown, places which are poor in one respect of digital technology, could be rich in another. "There are different ways of accessing the Internet or other data sources wirelessly, such as via cell phones, pagers, laptop computers, PDAs or other specially designed devices, such as the Blackberry. Technological standards, for example the relatively unsuccessful Wireless Application Protocol (WAP) developed in Europe for cell phone web browsing, or the more successful Japanese I-mode system, Wide Area Networks (WANs), and wireless Local Area Networks (WLANs) or Wi-Fi also represent different ways of organizing wireless data access, that are being used in different markets" (Castells *et al*., 2004: 29). The SIESTA maps are focused on one aspect of ICT penetration, i.e. computers, and they also stop at the time when these started to merge with cellphones, which increasingly incorporate IT services. Digital infrastructure has now become more sophisticated and i-pods have appeared. In this respect, the maps disregard the importance of the cellphone, social media and e-learning in social transformation. By contrast to a necessarily limited mapping exercise, therefore, policy guidelines must take into account several additional aspects of ICT technology and use, which the EU2020S has not tapped, and which are more important than, e.g., the use of computers, or persons employed in ICT. In order to draw policy lines, we will now examine: (1) the penetration of the cellphone, (2) the use and width of social networks, and (3) the institutionalization of e-learning. These are all important in understanding Digital Societies and producing policy guidelines.

2 "Automated ways of identifying the locations of Internet users are becoming increasingly sophisticated (see, for example, Atlas of Cyberspace at http://www.cybergeography.org/atlas/ and The Economist, 2001), and set to increase with the development of location-based services. However, the exploitation of such sources of data faces two main challenges: commercial sensitivity, and therefore access, and the need to have the full and informed consent of the data subjects for secondary analysis" (Craglia *et al*., 2004: 61).

8.4.1. The Importance of the Cellphone

Wireless technology and digital communication took off "with the most pervasive technology, the mobile phone. Mobile telephony really began to take off worldwide in the mid-1900s, when the ratio of mobile to mainline phones went up from about 1:34 (1991), to about 1:8 (1995). By 2000, there was one mobile phone to less than two mainlines, and by 2003 mobile phone subscriptions had overtaken mainline subscriptions for the first time. Thus, within the span of about 10 years mobile telephony has moved from being the technology for a privileged few, to essentially a mainstream technology" (Castells *et al*., 2004: 5). This has been the most democratic industrial revolution ever (Leontidou, 2010).

Table 8.1. Mobile telephone penetration growth rates (in percentage) in selected European countries (1995-2003). Source: Castells et al. (2004: 28).

Spain	3800	Luxembourg	1619
Belgium	3386	Italy	1488
France	3093	Switzerland	1328
Greece	2989	United Kingdom	859
Portugal	2627	Iceland	837
Netherlands	2206	Denmark	564
Ireland	1928	Finland	449
Austria	1842	Norway	405
Germany	1726	Sweden	391

Cellphone penetration has developed with interesting differences in rates among world regions, given that "Currently [2003], Europe leads (55.4%), followed by Oceania (54.4%) and North America (53%). These three regions each have more than one mobile telephone subscriber per two persons. They are followed distantly by Rest of the American continent (21.9%), Asia (15%) and Africa (6%), all of which have less than half the penetration rates of the top three regions" (Castells *et al*., 2004: 6). As shown in Table 8.1, "European countries such as Finland (448%) and Sweden (391%) had low rates, clearly a result of their already mature markets" (Castells *et al*., 2004: 28). "Quantitative data show that […] the European average penetration of mobile telephones is over 55%. Within the EU25 in particular, this ratio rises to 80%

and, in some countries, it is above 90% (Scandinavian countries, for instance). In practical terms, these figures point to the high popularization of this NICT" (Castells et al. 2004: 63).

The disaggregation in maps by NUTS2 and NUTS3 as done in SIESTA sometimes masks more important trends understood by re-aggregation. In 2004, the rate of cellphone subscriptions in the EU25 was split in an interesting way. "We consider the EU25, which is the current Union, but make a distinction between the ten new members of the 2004 enlargement (identified as EU10) and the former members (identified as EU15). This distinction is of the most interest because of the socioeconomical differentiation of these two groups of countries […]. We can see that in 2000 the number of mobile subscriptions surpassed the fixed ones in EU15, while this situation did not happen in the EU10 until the next year" (Castells *et al*., 2004: 14). "The leading countries are, as usual, the Nordic ones with Finland arriving at a penetration of 92% of households in 2003. What is most relevant is that the gap with respect to the Scandinavian countries has decreased over time, leading to a situation, in 2003, in which 7 out of every 10 households had a mobile telephone, except for France (66%)" (Castells *et al*., 2004: 63). France figures as a lagging country in other respects of ICT penetration in the Map 8.4.

8.4.2. Social Networks and Interactive Media

Wireless technology and digital communication has become interactive. Cities have played a leading role in digitisation and the related social change, with mobilisations through the use of the Internet and social media (Leontidou, 2010, 2012). The list below sums up some of the main social networking sites according to Institute of Employment Studies (2009: 7). These, and others similar, have generated a variety of new forms of interconnection which remain largely under-researched.

- Facebook — a social networking service where users create personal profiles, add other users as friends and exchange messages, including automatic notifications when they update their own profile. Additionally, users may join common-interest user groups, organised by common characteristics (e.g. workplace).
- Twitter — a microblogging service enabling its users to send and read publicly visible messages called tweets. Tweets are text-based posts of up to 140 characters displayed on the user's profile page. Users may subscribe to other users' tweets.

- LinkedIn — a business-related social networking site mainly used for professional networking. Users maintain a list of contact details of people with whom they have some level of relationship, called connections. This list of connections can then be used to build up a contact network, follow different companies and find jobs, people and business opportunities.
- MySpace — an online community of users' personal profiles. These typically include photographs, information about personal interests and blogs. Users send one another messages and socialise within the MySpace community.
- YouTube — a video-sharing website on which users can upload, share, and view videos. A wide variety of user-generated video content is displayed, including film and TV clips as well as amateur content such as video blogging. Media corporations including the BBC also offer some of their material via the site. Most videos enable users to leave and exchange comments.
- Wikipedia — a collaborative web-based encyclopaedia project; its 18 million articles have been written collaboratively by volunteers around the world, and almost all articles are freely editable by any visitor. A prominent web 2.0 site but not an example of social networking site per se.

8.4.3. The Importance of e-Learning

E-learning has different branches, including Open and Distance Learning, Lifelong Learning and training, and the active interaction with the Internet. We will not expand on these, because other EU2020S flagship initiatives refer to them —but not adequately— and because the lengthy reports of expert knowledge that the Hellenic Open University can provide on these issues are outside the scope of this paper. But they are certainly not outside the scope of the achievement of smart growth and the Digital Society sought by the EU2020S. The mapping of Open Universities would be a welcome step forward, though e-Learning is currently encouraged in traditional Universities, too.

8.5. Conclusion: Geographies of Information and Communications Technologies

In conclusion, our few policy guidelines, which are relevant for the flagship initiative "A Digital Agenda for Europe" thematic scope, must be read in com-

bination with policy guidelines for the flagship initiatives "Innovation Union", "Youth on the Move", and "An Agenda for New Skills and Jobs". However, the EU is in the middle of a crisis which makes the adoption of such guidelines problematic or unlikely, and that is an understatement. We have stressed that mapping a few indicators is inadequate for explanation and for policy guidelines. The comparison of patterns among the 4 maps and between these 4 and the rest of the maps developed within the SIESTA Project, can certainly not identify the economic, geographical, industrial, governmental policy and socio-cultural factors affecting the adoption of wireless communication technology in different regions and countries (as in Castells *et al*., 2004: 35-38), and the impact of this adoption on societies.

We have followed the route of all researchers who seek "less rigorous but pragmatically feasible indicators that capture at least some of the dimensions identified" (Craglia *et al*., 2004: 61). However, infrastructure, high-speed broadband connections, and high Internet velocity access is not all that matters. We have assessed a "need to focus not just on measures of physical access to the Internet but also on the extent to which the information available can make a difference to the quality of life, for example, through better provision of services, more direct dealing with government, greater participation, stronger community action, and whether the citizens across social and economic groupings have the skills, education, and knowledge necessary not only to access such information, but also to interpret it and use it to their benefit (social access)" (Craglia *et al*., 2004: 60). In any case, the projection is that as the older generation passes out, "digital illiteracy" will become scarcer.

Uneven regional development is to be expected in ICTs, which tend to form clusters of production, which create inequalities. This, however, is balanced out by networks of penetration and communication, which contribute in territorial cohesion through the facilitation of interaction among people, collectivities, cities, regions, universities, enterprises, institutional units, and several other entities. The high share of GDP invested in R&D (over 3% according to the EU2020S wish), the provision of infrastructure, high-speed broadband connections and Internet velocity access are therefore useful in promoting territorial cohesion, but do not seem to be the exclusive ways forward.

Planners and policy makers could work the other way round in order to engage populations in the digital society. The improvement of high-speed broadband connections is not a policy guideline which will boost demand for the Internet, nor can this be created by "educating" people who are "digitally illiterate" (as repeatedly stated in the EU2020S documentation). Rather, the

EU should encourage the activation of interest and involvement by supporting activities presupposing interaction within the Internet. Populations may be encouraged to seek physical access to the Internet by the modernization of public administration, by improvements in e-Government and e-Learning, which will contribute towards the improvement of their quality of life. During the crisis in Europe, the Digital Society points to a way forward, provided that the EU encourages several ICT-assisted low-cost activities which would be otherwise impossible.

Finally, it has to be pointed out that in general, in the ESPON space we have to distinguish between the 15 old member states (EU15), the recent additions to the EU (in 2004 and 2007) and the rest of the European countries which are not part of the EU. There are differences across and among them. But the most important distinction is related to which type of model will the EU and Europe itself follow in order to regulate and develop the Digital Society. In this respect we can say that right now there are at least three types of thinking regarding future developments: firstly, the (neo)liberal model of deregulation. Secondly, and in some opposition to that, we still have the European public service/public utility model which is directed towards the government regulating the field. And, finally, at EU member-states level, there are national models to consider. The above are to be found in many EU (and national policies) concerning the development of digital society in Europe as a whole. In general policy terms the main (unanswered question) still is: is the advancement of Digital Society primarily an economic project, is it political, or is it targeted towards social and cultural considerations and concerns?

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